PATENT ABSTRACTS OF JAPAN

(54) FM MULTIPLEX BROADCASTING RECEIVER

(57)Abstract:

PURPOSE: To provide an FM multiplex broadcasting receiver for facilitating a series of operations from confirming the reception of FM multiplex broadcasting on a display screen to selecting required information from the various kinds of received character information, eliminating the need of concentration on the operations so much and realizing the miniaturization of entire constitution concerning the FM multiplex broadcasting receiver for receiving digital data broadcasting such as traffic information or the like multiplexed on FM radio broadcasting and transmitted from a broadcasting station.

CONSTITUTION: This receiver is provided with a storage means 14 for classifying the extracted character information by each kind and storing it so as to be capable of being called corresponding to the specification of the kind, selecting switches 17 provided corresponding to respective display sections with pertinent kind names attached allocated for the respective kinds of the character information in menu display picture-outputted on the display screen of a display means 12 and a control means 15 for calling a unit of the character information of the pertinent kind from the storage means 14 corresponding to the specification by the selecting switch 17, transmitting it to the display means 12 and replacing the menu display of the display screen with it.
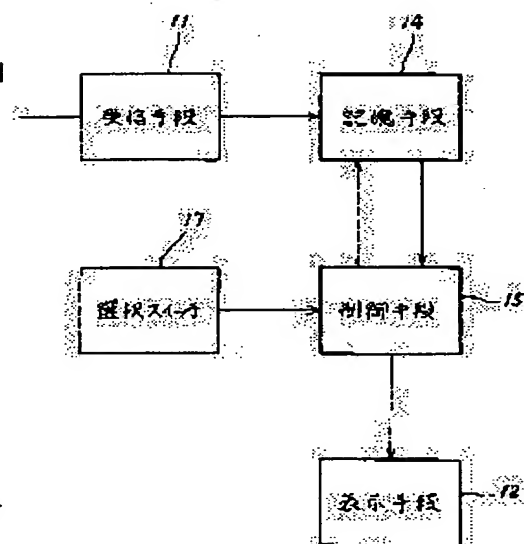
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CLAIMS

[Claim(s)]
[Claim 1] In the FM multiplex broadcast receiver which has a receiving means (11) to extract the text by the FM multiplex broadcast from FM radio broadcasting channel, and the display means (12) which carries out the image output of the one unit of this text on the display screen A storage means to classify said extracted text for every class of the, and to memorize possible [a call] according to assignment of this class (14), The selecting switch which was made to correspond to each of the display partition which attached the class name which assigned and corresponds to said display screen for every class of text in the menu display which carried out the image output, and was formed (17), The FM multiplex broadcast receiver characterized by having the control means (15) which calls the text of one unit of the class which corresponds from said storage means (14) according to assignment by said selecting switch (17), sends out to a display means (12), and is transposed to the menu display of said display screen.
[Claim 2] It is the FM multiplex broadcast receiver characterized by consisting of touch SUITCHI which operates by contact of an operator [on the FM multiplex broadcast receiver of claim 1 and as opposed to each of said display partition in said selection SUITCHI].
[Claim 3] It is the FM multiplex broadcast receiver characterized by for said control means identifying the are recording condition of the text for every class in said storage means in the FM multiplex broadcast receiver of claim 1, and having an are recording display means to change the image display condition of said display partition according to the existence of are recording of text.
[Claim 4] In the FM multiplex broadcast receiver of claim 1 said control means A reservation means in the text of the class specified with said selecting switch not being accumulated in said storage means to wait for are recording of the text of this class, and to notify an operator of this are recording, In the case of the text of the class specified with said selecting switch not being accumulated in said storage means A period until said selecting switch is operated at least and text is accumulated, the FM multiplex broadcast receiver characterized by having a reservation display means to change the image display condition of the reserved display partition with other parts.
[Claim 5] It is the FM multiplex broadcast receiver characterized by for said display means following to actuation of said selection SUITCHI in the FM multiplex broadcast receiver of claim 1, creating the status signal of said class name, and having the title display means which carries out an image output on said display screen together with one unit of said text.
[Claim 6] the FM multiplex broadcast receiver characterized by for said title display means coming out with the storage element which made a different character—font pattern for a display for every class of said text memorize, and a selection means to call the character—font pattern for a display which follows and corresponds to actuation of said selection SUITCHI, and being constituted in the FM multiplex broadcast receiver of claim 5.
[Claim 7] It is the FM multiplex broadcast receiver characterized by identifying the information number by which said storage means is included in the text of said one unit in the FM multiplex broadcast receiver of claim 1, and having an updating means to eliminate old text when the text of the already accumulated same information number is inputted.
[Claim 8] While carrying out the image output of the tuning display which has arranged the display partition of two or more presetting received frequency on said display screen in the FM multiplex broadcast receiver of claim 1 A selected tuning display means to change the display of one display partition with other directions parts, Mode change SUITCHI which makes the image output on said display screen shift to said tuning display from said menu display or presenting of the text of one unit, The presetting station selecting switch which was made to correspond to each of the directions part of two or more of said presetting received frequency, and was formed, The tuning adjustment device which adjusts the received frequency at that time according to the station selection by said presetting station selecting switch, The FM multiplex

SUITCHI, and establishing a SUITCHI mode change means to operate said selection SUITCHI as presetting station selection SUITCHI.

[Claim 9] The FM multiplex broadcast receiver characterized by establishing a frequency-spectrum-designation means to display the received frequency at that time, an FM multiplex broadcast discernment means to identify the existence of the FM multiplex broadcast in the receiving channel at that time, and an FM multiplex broadcast display means to display the propriety of FM multiplex broadcast reception according to the output of this FM multiplex broadcast discernment means, in the FM multiplex broadcast receiver of claim 8.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the FM multiplex broadcast receiver which receives digital data transmission, such as traffic information which is made to carry out multiplex to FM radio broadcasting, and is sent out from a broadcasting station.
[0002]
[Description of the Prior Art] The proposal which is made to carry out multiplex to FM radio broadcasting, and sends out digital data transmission, such as traffic information, from a broadcasting station is made. It is called the FM multiplex broadcast, the part which is not used for FM radio broadcasting in the one-channel band (100kHz) of FM radio broadcasting for commerce of a 76-90MHz band is used, and this digital data transmission is 10kbps(es) substantially about text. It broadcasts as the following digital data.
[0003] The FM multiplex broadcast is setting to provide an automobilism person with the traffic information on **** to one of the main purposes, distributes an one-channel independence or multiple channel regardless of a broadcast program, and broadcasts continuously the traffic information of many points in a large area, delay information, the newest accident information, regulation information, weather intelligence, the empty information on a parking lot, the passage duration of the specific section, a warning, an alarm, etc.
[0004] and the thing for which an operator can reproduce and hear the usual stereophonic broadcasting of a channel by which station selection was made if the station selection of the FM-multiplex-broadcast receiver carried in the car makes at the specific channel containing an FM multiplex broadcast — in addition, it can check by looking considering the traffic information on the location of a request at the time of day of arbitration as text on the display screen, without waiting for the traffic information on the conventional type inserted in spacing of a broadcast program, or hearing and missing the traffic information on a required location. A period until text is updated and updated by the newest information every moment is repeatedly transmitted from the same contents. The text of a large number belonging to many genres (class) is serially connected in the state of time sharing, and text is transmitted repeatedly.
[0005] With the receive section where an FM multiplex broadcast receiver extracts the text by the FM multiplex broadcast from the band of one channel of FM radio broadcasting It has the display which carries out the image output of the one unit of text on the display screen. For example, the digital data which reproduced the digital data of text one after another from the FM multiplex broadcast, was accumulated in the internal memory, and the operator (operator) itself operated the FM multiplex broadcast receiver, and was accumulated in the internal memory is searched. The text (for example, delay situation of the crossing of 1km beyond) of a required class is discovered, and this is displayed on a television screen etc.
[0006] The part which the receive section of an FM multiplex broadcast receiver does not have can share the regenerative circuit (part which receives one channel of FM radio broadcasting and reproduces baseband signaling especially) of the conventional FM stereo voice broadcast.
[0007]
[Problem(s) to be Solved by the Invention] Since an FM multiplex broadcast receiver is operated itself and required text is chosen in the FM multiplex broadcast receiver of a mounted mold in many cases while an operator drives an automobile, it is desirable for concentration not to be required by access to to be easy and text to be operated.
[0008] An operator opts for reception of traffic information and it is (1). Station selection of the FM-broadcasting channel to which the FM multiplex broadcast is sent out is made. (2) Reception of an FM multiplex broadcast is checked to the display screen, traffic information is chosen from various text, and it is (3). A series of actuation until it chooses the traffic information on the location needed out of the traffic information on various points is complicated. An FM multiplex broadcast receiver to be concentrated

surrounding traffic condition and operation, and increases risk, and its about [giving an operator a complicated impression] and safety operation top is not desirable, either. On the other hand, the FM multiplex broadcast receiver with required at every reception of an FM multiplex broadcast suspending a car at the road shoulder and searching text may make an operator lose the volition of reception, or the car which stopped may block traffic and it may generate new delay.

[0009] And an FM multiplex broadcast receiver is designed by the good small configuration of a settlement to the space of the vehicle interior of a room, and it is desirable for the area of actuation and image display to be small. However, when the area of actuation and image display becomes small, generally high concentration and long time amount are needed for reading of required actuation and text.

[0010] A series of actuation until it checks reception of an FM multiplex broadcast to the display screen and chooses required information from the received various text is easy, and seldom needs concentration for actuation, but moreover, this invention aims at offering the FM multiplex broadcast receiver which can carry out reading of required actuation and text easily, even if the area of actuation and image display is small.

[0011]
[Means for Solving the Problem] Drawing 1 is the explanatory view of the fundamental configuration of invention of claim 1. In drawing 1 the FM multiplex broadcast receiver of claim 1 In the FM multiplex broadcast receiver which has a receiving means 11 to extract the text by the FM multiplex broadcast from FM radio broadcasting channel, and the display means 12 which carries out the image output of the one unit of this text on the display screen A storage means 14 to classify said extracted text for every class of the, and to memorize possible [a call] according to assignment of this class, The selecting switch 17 which was made to correspond to each of the display partition which attached the class name which assigned and corresponds to said display screen for every class of text in the menu display which carried out the image output, and was formed, The text of one unit of the class which corresponds from said storage means 14 according to assignment by said selecting switch 17 is called, and it sends out to said display means 12, and has the control means 15 replaced with the menu display of said display screen.

[0012] Here, when the text of two or more units belongs to the same class, the text of a unit may be around passed on the display screen, and scrolling SUITCHI which specifies the text of one unit before and after carrying out image display on the display screen may be prepared. Moreover, change SUITCHI which returns a display screen to the original menu display compulsorily from the text of one unit may be prepared.

[0013] Moreover, a storage means to memorize the text from which another FM multiplex broadcast receiver of the example of a configuration was extracted with the receiving means, The control means which searches the text accumulated in the storage means, selects the thing of the class corresponding to assignment by selection SUITCHI, sends out to a display means, and the display screen is made to carry out image display, It has a menu display means to carry out image display of the menu display screen which was fitted to the array of two or more selection SUITCHI, and has arranged the display partition with a class name to said display means, and the text of one unit is displayed in the format which replaces a menu display.

[0014] It consists of touch SUITCHI which operates by contact of an operator [on the FM multiplex broadcast receiver of claim 1 and as opposed to / receiver / of claim 2 / FM multiplex broadcast / each of said display partition in said selection SUITCHI].

[0015] In the FM multiplex broadcast receiver of claim 1, said control means identifies the are recording condition of the text for every class in said storage means, and the FM multiplex broadcast receiver of claim 3 has an are recording display means to change the image display condition of said display partition according to the existence of are recording of text.

[0016] The FM multiplex broadcast receiver of claim 4 is set to the FM multiplex broadcast receiver of claim 1. Said control means A reservation means in the text of the class specified with said selecting switch not being accumulated in said storage means to wait for are recording of the text of this class, and to notify an operator of this are recording, In the text of the class specified with said selecting switch not being accumulated in said storage means, it has a period until said selecting switch is operated at least and text is accumulated, and a reservation display means to change the image display condition of the reserved display partition with other parts.

[0017] In the FM multiplex broadcast receiver of claim 1, said display means follows to actuation of said selection SUITCHI, creates the status signal of said class name, and the FM multiplex broadcast receiver of claim 5 has the title display means which carries out an image output on said display screen together with one unit of said text.

[0018] the FM multiplex broadcast receiver of claim 6 comes out of said title display means in the FM multiplex broadcast receiver of claim 5 with the storage element which made a different character-font

pattern for a display for every class of said text memorize, and a selection means to call the character-font pattern for a display which follows and corresponds to actuation of said selection SUITCHI, and it is constituted.

[0019] In the FM multiplex broadcast receiver of claim 1, said storage means identifies the information number contained in the text of said one unit, and the FM multiplex broadcast receiver of claim 7 has an updating means to eliminate old text, when the text of the already accumulated same information number is inputted.

[0020] While the FM multiplex broadcast receiver of claim 8 carries out the image output of the tuning display which has arranged the display partition of two or more presetting received frequency on said display screen in the FM multiplex broadcast receiver of claim 1 A selected tuning display means to change the display of one display partition with other directions parts, Mode change SUITCHI which makes the image output on said display screen shift to said tuning display from said menu display or presenting of the text of one unit, The presetting station selecting switch which was made to correspond to each of the directions part of two or more of said presetting received frequency, and was formed, The tuning adjustment device which adjusts the received frequency at that time according to the station selection by said presetting station selecting switch, It ****, and it follows to actuation of said mode change SUITCHI, and a SUITCHI mode change means to operate said selection SUITCHI as presetting station selection SUITCHI is established.

[0021] The FM multiplex broadcast receiver of claim 9 establishes a frequency-spectrum-designation means to display the received frequency at that time, an FM multiplex broadcast discernment means to identify the existence of the FM multiplex broadcast in the receiving channel at that time, and an FM multiplex broadcast display means to display the propriety of FM multiplex broadcast reception according to the output of this FM multiplex broadcast discernment means, in the FM multiplex broadcast receiver of claim 8.

[0022]

[Function] With the FM multiplex broadcast receiver of claim 1, the image display of the menu display can be carried out to the display screen of the display means 12, and if selection SUITCHI which was made to correspond to a menu display and was prepared is operated and an operator chooses a desired class, an image output will be carried out in the format that one unit of the text belonging to this class replaces a menu display.

[0023] In drawing 1 , the receiving means 11 extracts the data multiplex band excluding the baseband band of a stereo sound signal from the band of one channel of FM radio broadcasting, restores to the digital data by which FM modulation was carried out, and reproduces the text which performed error detection and agreement correction and consisted of predetermined character codes.

[0024] The text of one unit consists of a header block which distinguishes the class and order of text (time of day, information numerical, etc.), and a data block of the net following this. The storage means 14 reads a header block in the text sent out one after another from the receiving means 11, identifies the class of text, classifies it for every class, and memorizes text. The storage means 14 outputs at a time one unit of text of the class by the control means 15, or the class which corresponds according to one-by-one assignment.

[0025] The display means 12 changes and displays the text of a character code format on the image of the kanji of a multi-line, kana, a figure, and the alphabet, and a television screen, the liquid crystal display component of a multi-DODDO mold, a plasma display device, an LED display device, etc. are adopted as a display screen.

[0026] The internal memory of the display means 12 memorizes beforehand as an image, and the menu display by which image display is carried out to the display screen of the display means 12 is intuitively arranged at an operational condition corresponding to the display partition [in / in selection SUITCHI 17 / a menu display] for every class. Correspondence of a selecting switch 17 and a display partition is (1). The remote control which has arranged the ten key switch which attached the number is fixed to the core of the wheel of an automobile. Give the number of 0-9 corresponding to the display partition which attached the class name in a menu display to ten key SUITCHI, or (2) You may secure in you arranging the display partition in a menu display to a horizontal single tier, making it located under each display partition on the frame of a display screen, and arranging push-button SUITCHI.

[0027] A menu display will be transposed to the text of the class chosen promptly, if assignment actuation of the class of text is made through selection SUITCHI 17. At this time, according to the input from selection SUITCHI 17, a control means 15 calls only one unit and sends out the storage means 14 to one kind of text to the display means 12.

[0028] When it belongs to one kind of traffic information on intersectional and the information on several

search one unit (1 chome of for example, ****) out of the text of the a large number unit belonging to one class. Then, the skip of the text belonging to the same class can be carried out to information numerical order on a display screen until it prepares scrolling SUITCHI and encounters required text.

[0029] Moreover, image display of one kind of text is carried out, and change SUITCHI may be prepared to come to see the text of another kind so that a display screen can be immediately returned to a menu display compulsorily. However, when image display of the same text continues being carried out to the display screen beyond fixed time amount, the auto return function automatically returned to a menu display may be prepared in the display means 12.

[0030] If a control means calls in order the text accumulated in the storage means, reads a header block and agrees in assignment of the header block by selection SUITCHI, this text will be sent out to a display means and the display screen will be made to carry out image display in another FM multiplex broadcast receiver of the example of a configuration. In a menu display screen, the class (genre) name applicable to each of the display partition made into two or more selection SUITCHI 1 to 1 **** is attached, and an operator looks through a class name on a display screen, operates two or more selection SUITCHI intuitively, and can access the text of a required class.

[0031] In the FM multiplex broadcast receiver of claim 2, selection SUITCHI consists of touch SUITCHI, and an operator touches each display partition on a display screen directly, and can choose the class of text. The transparent electrode mold stuck on the display screen, the infrared mold which detects protection from light, the ultrasonic mold which detects attenuation of vibration can be used for touch SUITCHI.

[0032] In the FM multiplex broadcast receiver of claim 3, uniformly, the image condition of each display partition in a menu display is not eternal, and changes it into the image conditions (deletion of change of color or brightness, lighting flashing, and a display partition, character representation which is not accumulated [are recording /]) which reflected the are recording condition of the text for every class in a storage means with the are recording display means to regulate automatically. At this time, the display partition of the accumulated class (genre) is made into a selectable condition, and the display partition of a non-accumulated class (genre) is good also as selection disapproval. Therefore, an operator only looks at a menu display and can identify the are recording condition of the text received by that time.

[0033] In the FM multiplex broadcast receiver of claim 4, when an operator wishes to receive and the text of a required class is not accumulated in a storage means, a reservation display means is used and reception can be reserved. A reservation display means supervises the are recording condition of the text in a storage means instead of an operator, and shortly after the text of the reserved class is accumulated, it notifies the completion of are recording to an operator. At this time, the text of the reserved class may be immediately displayed on the display screen of a display means.

[0034] And a reservation display means changes the image conditions (deletion of change of color or brightness, lighting flashing, and a display partition, character representation which is not accumulated [are recording /]) of the display partition concerning reservation in parts for other display about a period until the text of the class reserved at least is accumulated, and expresses the fact that reservation was performed, to the display screen.

[0035] With the FM multiplex broadcast receiver of claim 5, the data of a header block are read in the text of one unit called from the storage means for image display, and the image output of the parts (class etc.) which carry out character representation from a header block at least is carried out in the format which it tends to read except being specified as the header block.

[0036] The image output form specified as the header block serves as a katakana cable address display (for example, JUUTAI) for number-of-bits saving, and is changed into the kanji Cana mixture word (delay information) which is easy to read this. For example, a required number of kanji Cana mixture words are beforehand accumulated in the internal memory of a display means, the command signal according to the contents of reading of the data of a header block is sent out from a control means, and image display of the corresponding kanji Cana mixture word is carried out to the upper part of the display screen.

[0037] In the FM multiplex broadcast receiver of claim 6, a character-font pattern for a display which is different for every class of text in a storage element is made to memorize, and the character-font pattern for a display with which a selection means follows and corresponds to actuation of selection SUITCHI is called.

[0038] In the FM multiplex broadcast receiver of claim 7, when the hour entry and information number of a header block which are contained in the text of one unit are identified and the text of the same information number is already accumulated, the older one is eliminated and the newer one is memorized. The information which became unnecessary by this is arranged and an operator can carry out required retrieval only in the range of always new information. Moreover, when the corresponding text is already then displayed on the display screen, a display may be immediately replaced by new text. Moreover, the updated

text is memorized all together and you may indicate by automatic for every fixed time amount in the display screen. The newest text can thereby always be displayed automatically.

[0039] For example, the delay information on the 1 chome crossing of **** at 3:00 p.m. is automatically transposed to the delay information on the 1 chome crossing of **** at 4:00 p.m. However, text with the same old information number can also be utilized, when investigating the die length of delay serially and expecting a future delay situation (an improvement, aggravation). Therefore, old text may not be eliminated immediately but another storage means memorized in the condition that it can call within the limit of fixed time amount if needed may be established. Moreover, in case it accumulates in another storage means, the text which saves and has utility value may be identified and an unnecessary thing may be removed.

[0040] In the FM multiplex broadcast receiver of claim 8, the configuration of the operating part in the FM multiplex broadcast receiver which has the function of the receiver of the usual FM commercial broadcasting (stereo voice) is simplified. That is, the condition in which reception adjustment of FM commercial broadcasting is possible is converted into the condition that required information can be retrieved by actuation of mode change SUITCHI, through an FM multiplex broadcast, and it is (1) to coincidence. Image display changes from a tuning display to a menu display, and it is (2). SUITCHI which perform reception adjustment of FM commercial broadcasting is diverted as they are to SUITCHI which retrieve required information through an FM multiplex broadcast.

[0041] In the FM multiplex broadcast receiver of claim 9, even when one of the presetting stations is chosen, and even when changing received frequency continuously manually, an operator can check the received frequency at that time by looking through a frequency-spectrum-designation means. And an operator can check by looking that an FM multiplex broadcast can receive from the received channel through an FM multiplex broadcast display means.

[0042] There are few channels which an FM multiplex broadcast can receive among the channels of FM radio broadcasting, and the FM multiplex broadcast may not be sent out only by commercial broadcasting by the channel which an FM multiplex broadcast can receive depending on the time zone. Therefore, looking for the channel which an FM multiplex broadcast can actually receive also has many difficulties. Moreover, in a remote place, since the quota channel of a broadcasting station is not the same as that of the thing of the suburbs ground, preset frequency stops being helpful, received frequency will be adjusted one by one by manual actuation, and presetting will newly be done again. In such a case, it sets, and a frequency-spectrum-designation means and an FM multiplex broadcast display means discover the channel which contains an FM multiplex broadcast in whether you are Sumiya, and save time amount until it receives text data.

[0043]

[Example] Drawing 2 is the explanatory view of the circuitry of the FM multiplex broadcast receiver of the 1st example, and drawing 3 is the external view of the FM multiplex broadcast receiver of drawing 2 . Here, although the FM multiplex broadcast receiver is built into the car stereo equipped with the receiver of FM commercial broadcasting, it has the receive section of an FM multiplex broadcast which became independent of the receive section of FM commercial broadcasting, and FM commercial broadcasting of another channel can be enjoyed, performing reception of an FM multiplex broadcast, and are recording of text.

[0044] It consists of the interface sections 23 which an operator searches the text stored in the FM multiplex broadcast receive section 22 which an FM multiplex broadcast receiver chooses FM radio broadcasting receive section 21 which chooses the channel of arbitration and does voice playback of the usual stereophonic broadcasting, and the specific channel which is carrying out the FM multiplex broadcast, accumulates text, and outputs the text of one specific unit according to retrieval by the operator, and the FM multiplex broadcast receive section 22 in drawing 2 , and carry out image display. The electric wave received with the antenna 25 is distributed to FM radio broadcasting receive section 21 and the FM multiplex broadcast receive section 22 through branching 24.

[0045] The FM multiplex broadcast receive section 22 has two memory, one memory accumulates and updates the received text for every class, and the memory of another side chooses received frequency according to the classification of required information, when received frequency of the FM-broadcasting channel which an FM multiplex broadcast can receive is memorized (presetting is possible) and there are more than one.

[0046] After the FM multiplex broadcast receive section 22 extracts the 60-92kHz part centering on 76kHz of carrier frequencies among the 100kHz one-channel quota bands of FM broadcasting, does FM detection, restores to the digital data by which the L-MSK (Minimumm Shift Keying) modulation was carried out and performs predetermined error detection and agreement correction, it does a class division for every text of one unit which creates the 1 display screen, and stores in memory in the state of judgment.

[0047] The microcomputer for data processing of the FM multiplex broadcast receive section 22 processes

various functions (– means) in time sharing according to the carried program. For example, it is taking charge of retrieval of the text data memorized by memory, a classification, processing of the signal from SUITCHI of a control unit, the modification command of the image display of a liquid crystal display monitor, etc.

[0048] In drawing 3 , an FM multiplex broadcast receiver is constituted from a receiving panel 33 by which hinge connection was made, and remote control 38 equipped with ten key SUITCHI for menu selection by the case which has arranged the control panel 32 in the front face, and the lower part of a control panel 32. A body 31 is equipped with a cassette deck device and amplifier equipment, amplifies the stereo sound signal of the commercial broadcasting sent out from case side 32, and drives the mounted loudspeaker.

[0049] Actuation SUITCHI 35 for searching the text which the liquid crystal display component 34 of a multi–DODDO mold and an operator need for a control panel 32 is arranged. On the other hand, the tuning carbon button 36 which preset the channel of FM commercial broadcasting, and the vertical adjustment carbon button 37 of the received frequency for performing manual tuning are arranged at the receiving panel 33.

[0050] Drawing 4 is the explanatory view of the control panel of the FM multiplex broadcast receiver of the 1st example, and drawing 5 is the explanatory view of the are recording condition of text. The inside of drawing 4 , and (a) A menu display condition and (b) The display condition of text is shown. Here, selection of the class of required text transposes a menu screen to presenting of text.

[0051] Drawing 4 (a) It sets, and the menu display is made by the liquid crystal display component 34 of a control panel 32, six display partitions 44–49 are arranged at width 1 train, and the class name (delay, snow coverage, accident, —) applicable to each of the display partitions 44–49 and the number of 1–6 are displayed on it. Here, if the number 1 of the display partition 44 of delay is specified by ten key SUITCHI of remote control 38, a screen will be drawing 4 (b). The delay information on one concrete unit is replaced.

[0052] Moreover, drawing 4 (b) If menu SUITCHI 43 is operated in the state of delay information, the contents of a display of the liquid crystal display component 34 will be drawing 4 (a). It returns to a menu display and is drawing 4 (a). If NeXT SUITCHI 40 is operated in the state of a menu display, the display partition of another class to which the number of 7–9 was given will be displayed. furthermore, drawing 4 (b) If rise scrolling SUITCHI 41 and dounce crawl SUITCHI 42 are operated in the state of delay information, another text which the same class bundled with the FM multiplex broadcast receiver, appeared in it, and was accumulated in it will go back to the liquid crystal display component 34 in order, will transpose information numerical order or an information number to it, and will be displayed on it.

[0053] It sets to drawing 5 and is drawing 4 (a) in memory 51. By the control section 53, the text which the address classified into six display partitions by corresponding is prepared, and is sent out to a control section 53 from the data decode section 52 is read in the class data of a header block, and is classified and accumulated in the address according to a class. Moreover, the already memorized text and the new text to which the same information number was given are memorized in the format which replaces old text. A control section 53 updates periodically the text displayed on a display 54, and always displays the newest text. Moreover, a control section 53 detects the are recording condition of the text in memory 51, and displays particularly the display partition 44 and 47 with are recording, i.e., the display partitions of a menu display of drawing 4 (a) in a display 54, brightly.

[0054] Moreover, if an operator specifies the display partition of a non–accumulated class as memory 51, an operator will be notified of the display partition of the specified class being in a flashing condition, and it being in a reservation condition with a menu display. And as soon as the text of the specified class is accumulated in memory 51, this text replaces a menu display, an electronic buzzer operates to coincidence, and an operator is notified of the completion of reception.

[0055] Furthermore, drawing 4 (b) The alphabetic character of the delay information on the upper part of the display screen of text is not the katakana cable address display specified as the header block of the data transmitted as an FM multiplex broadcast, and carries out image reconstruction of one of the fonts of two or more kanji Cana mixture words accumulated in the display 54 according to the command from a control section 53.

[0056] Drawing 6 is the explanatory view of the control panel of the FM multiplex broadcast receiver of the 2nd example. The inside of drawing 6 , and (a) The mode and (b) which tune up an FM–broadcasting channel The mode while receiving an FM multiplex broadcast is shown. Here, it realizes on a control panel and tuning of a presetting office is also enabling operation of the function of the receiving panel of drawing 3 only by the actuation on a control panel.

[0057] Drawing 6 (a) It sets and the touch sensor 69 which six display partitions 68 displayed on the liquid crystal display component 62 and the liquid crystal display component 62 looked like [the control panel 61], respectively, and has been arranged in piles, the display device 63 of received frequency, rise scrolling SUITCHI 64, dounce crawl SUITCHI 65, mode change SUITCHI 66, and menu SUITCHI 67 are arranged

[0058] In tuning in FM radio broadcasting, it operates mode SUITCHI 66 here, and it is drawing 6 (a) about the display of the liquid crystal display component 62. If it changes into a condition, the received frequency of an FM receiver can be changed by the manual using rise scrolling SUITCHI 64 and dounce crawl SUITCHI 65. Moreover, image display of the frequency of the presetting channel set beforehand is carried out to the display partition 68 which is six pieces, if the corresponding display partition 68 is touched, a touch sensor 69 will operate and regulating automatically of the received frequency will be carried out to the presetting channel. In any case, received frequency is displayed on a display device 63 as it is.

[0059] Furthermore, when the FM multiplex broadcast is contained in the actually tuned-in channel (the frequency was displayed on the display device 63), an indicator 70 lights up and the condition which can receive an FM multiplex broadcast is displayed. An operator operates rise scrolling SUITCHI 64 and dounce crawl SUITCHI 65, borrows the assistance of a display device 63 and an indicator 70, and performs a setup of a required channel selection and preset frequency.

[0060] On the other hand, it is drawing 6 (a). The display of the liquid crystal display component 62 is drawing 6 (b), maintaining FM playback condition at that time, when operating mode SUITCHI 66 in the condition. It shifts to a condition and retrieval of the text memorized through the FM multiplex broadcast is attained.

[0061] Drawing 6 (b) It is drawing 4 (b) about the text of a required class by setting, displaying the class of text on six display partitions 68, contacting the corresponding display partition 68, and operating a touch sensor 69. Image display can be carried out in a format [like].

[0062]
[Effect of the Invention] If the display partition of a display screen of a menu display is chosen according to the FM multiplex broadcast receiver of claim 1 and selection SUITCHI is operated, since the image output of the text of a required class is greatly carried out on the same screen, actuation is easy, a check by looking is easy, the whole equipment will be constituted by the compact and the required number of SUITCHI to arrange will also be reduced.

[0063] Therefore, also while centralizing an operator's attention on a surrounding traffic condition and operation and having received the FM multiplex broadcast, a safety operation can be continued, and whenever it is reception, stopping and parking which it is is not needed, either. And easy actuation enables the retrieval and use of frequent and detailed text in an operator, the skill about use of text is repeated, and the operation purpose of the FM multiplex broadcast of attaining carrying out smoothly of traffic is realized promptly.

[0064] Furthermore, even when an FM multiplex broadcast receiver is designed in the good small configuration of a settlement to the space of the vehicle interior of a room, the area of actuation and image display can be secured greatly, and pains is not taken over reading of actuation or text.

[0065] According to the FM multiplex broadcast receiver of claim 2, since an operator touches each display partition on a display screen directly and can choose the class of text, the class (genre) of text and correspondence of selection SUITCHI will become more nearly intuitive, operability of selection SUITCHI improves, and operation mistake also decreases.

[0066] According to the FM multiplex broadcast receiver of claim 3, since the are recording condition of the text for every class can be checked by looking in the phase of a menu display, an operator comes to search, only when there is information, and he does not need to perform useless retrieval, and an operation mistake and impossible actuation by misconception of operating state also decrease.

[0067] According to the FM multiplex broadcast receiver of claim 4, since reception and a display of the text of a required class can be reserved and the completion of reception can be recognized automatically, the text of a required class can be acquired by the minimum time amount and the minimum effort. It becomes unnecessary moreover, to check whether text is accumulated before retrieval. Furthermore, since the fact that reservation was performed is displayed on the display screen, it is not necessary to perform useless retrieval.

[0068] According to the FM multiplex broadcast receiver of claims 5 and 6, since an image output is carried out in the format of being easy to read the part which carries out character representation from a header block, a check by looking becomes easy.

[0069] According to the FM multiplex broadcast receiver of claim 7, since an operator can carry out required retrieval only in the range of always new information, time amount and time and effort required for retrieval are saved.

[0070] According to the FM multiplex broadcast receiver of claim 8, since SUITCHI required for actuation of the receiver of FM commercial broadcasting (stereo voice) is diverted to SUITCHI for retrieval of text, the structure of the control panel of an FM receiver is simplified, actuation becomes easy, and the miniaturization of the whole receiver is attained, without spoiling operability and visibility.

[0071] According to the FM multiplex broadcast receiver of claim 9, a frequency-spectrum-designation

means and an FM multiplex broadcast display means are checked by looking, and an operator can access easily the broadcast channel which can receive an FM multiplex broadcast, starts reception of an FM multiplex broadcast at an early stage, and can acquire required text to the inside of a short time.

[Translation done.]

TECHNICAL FIELD

[Industrial Application] This invention relates to the FM multiplex broadcast receiver which receives digital data transmission, such as traffic information which is made to carry out multiplex to FM radio broadcasting, and is sent out from a broadcasting station.

[Translation done.]

PRIOR ART

[Description of the Prior Art] The proposal which is made to carry out multiplex to FM radio broadcasting, and sends out digital data transmission, such as traffic information, from a broadcasting station is made. It is called the FM multiplex broadcast, the part which is not used for FM radio broadcasting in the one-channel band (100kHz) of FM radio broadcasting for commerce of a 76-90MHz band is used, and this digital data transmission is 10kbps(es) substantially about text. It broadcasts as the following digital data.
[0003] The FM multiplex broadcast is setting to provide an automobilism person with the traffic information on **** to one of the main purposes, distributes an one-channel independence or multiple channel regardless of a broadcast program, and broadcasts continuously the traffic information of many points in a large area, delay information, the newest accident information, regulation information, weather intelligence, the empty information on a parking lot, the passage duration of the specific section, a warning, an alarm, etc.
[0004] and the thing for which an operator can reproduce and hear the usual stereophonic broadcasting of a channel by which station selection was made if the station selection of the FM-multiplex-broadcast receiver carried in the car makes at the specific channel containing an FM multiplex broadcast — in addition, it can check by looking considering the traffic information on the location of a request at the time of day of arbitration as text on the display screen, without waiting for the traffic information on the conventional type inserted in spacing of a broadcast program, or hearing and missing the traffic information on a required location. A period until text is updated and updated by the newest information every moment is repeatedly transmitted from the same contents. The text of a large number belonging to many genres (class) is serially connected in the state of time sharing, and text is transmitted repeatedly.
[0005] With the receive section where an FM multiplex broadcast receiver extracts the text by the FM multiplex broadcast from the band of one channel of FM radio broadcasting It has the display which carries out the image output of the one unit of text on the display screen. For example, the digital data which reproduced the digital data of text one after another from the FM multiplex broadcast, was accumulated in the internal memory, and the operator (operator) itself operated the FM multiplex broadcast receiver, and was accumulated in the internal memory is searched. The text (for example, delay situation of the crossing of 1km beyond) of a required class is discovered, and this is displayed on a television screen etc.
[0006] The part which the receive section of an FM multiplex broadcast receiver does not have can share the regenerative circuit (part which receives one channel of FM radio broadcasting and reproduces baseband signaling especially) of the conventional FM stereo voice broadcast.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] If the display partition of a display screen of a menu display is chosen according to the FM multiplex broadcast receiver of claim 1 and selection SUITCHI is operated, since the image output of the text of a required class is greatly carried out on the same screen, actuation is easy, a check by looking is easy, the whole equipment will be constituted by the compact and the required number of SUITCHI to arrange will also be reduced.

[0063] Therefore, also while centralizing an operator's attention on a surrounding traffic condition and operation and having received the FM multiplex broadcast, a safety operation can be continued, and whenever it is reception, stopping and parking which it is is not needed, either. And easy actuation enables the retrieval and use of frequent and detailed text in an operator, the skill about use of text is repeated, and the operation purpose of the FM multiplex broadcast of attaining carrying out smoothly of traffic is realized promptly.

[0064] Furthermore, even when an FM multiplex broadcast receiver is designed in the good small configuration of a settlement to the space of the vehicle interior of a room, the area of actuation and image display can be secured greatly, and pains is not taken over reading of actuation or text.

[0065] According to the FM multiplex broadcast receiver of claim 2, since an operator touches each display partition on a display screen directly and can choose the class of text, the class (genre) of text and correspondence of selection SUITCHI will become more nearly intuitive, operability of selection SUITCHI improves, and operation mistake also decreases.

[0066] According to the FM multiplex broadcast receiver of claim 3, since the are recording condition of the text for every class can be checked by looking in the phase of a menu display, an operator comes to search, only when there is information, and he does not need to perform useless retrieval, and an operation mistake and impossible actuation by misconception of operating state also decrease.

[0067] According to the FM multiplex broadcast receiver of claim 4, since reception and a display of the text of a required class can be reserved and the completion of reception can be recognized automatically, the text of a required class can be acquired by the minimum time amount and the minimum effort. It becomes unnecessary moreover, to check whether text is accumulated before retrieval. Furthermore, since the fact that reservation was performed is displayed on the display screen, it is not necessary to perform useless retrieval.

[0068] According to the FM multiplex broadcast receiver of claims 5 and 6, since an image output is carried out in the format of being easy to read the part which carries out character representation from a header block, a check by looking becomes easy.

[0069] According to the FM multiplex broadcast receiver of claim 7, since an operator can carry out required retrieval only in the range of always new information, time amount and time and effort required for retrieval are saved.

[0070] According to the FM multiplex broadcast receiver of claim 8, since SUITCHI required for actuation of the receiver of FM commercial broadcasting (stereo voice) is diverted to SUITCHI for retrieval of text, the structure of the control panel of an FM receiver is simplified, actuation becomes easy, and the miniaturization of the whole receiver is attained, without spoiling operability and visibility.

[0071] According to the FM multiplex broadcast receiver of claim 9, a frequency-spectrum-designation means and an FM multiplex broadcast display means are checked by looking, and an operator can access easily the broadcast channel which can receive an FM multiplex broadcast, starts reception of an FM multiplex broadcast at an early stage, and can acquire required text to the inside of a short time.

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Since an FM multiplex broadcast receiver is operated itself and required text is chosen in the FM multiplex broadcast receiver of a mounted mold in many cases while an operator drives an automobile, it is desirable for concentration not to be required by access to to be easy and text to be operated.
[0008] An operator opts for reception of traffic information and it is (1). Station selection of the FM-broadcasting channel to which the FM multiplex broadcast is sent out is made. (2) Reception of an FM multiplex broadcast is checked to the display screen, traffic information is chosen from various text, and it is (3). A series of actuation until it chooses the traffic information on the location needed out of the traffic information on various points is complicated. An FM multiplex broadcast receiver to be concentrated continuous to a display screen or actuation SUITCHI keeps away an operator's attention from a surrounding traffic condition and operation, and increases risk, and its about [giving an operator a complicated impression] and safety operation top is not desirable, either. On the other hand, the FM multiplex broadcast receiver with required at every reception of an FM multiplex broadcast suspending a car at the road shoulder and searching text may make an operator lose the volition of reception, or the car which stopped may block traffic and it may generate new delay.
[0009] And an FM multiplex broadcast receiver is designed by the good small configuration of a settlement to the space of the vehicle interior of a room, and it is desirable for the area of actuation and image display to be small. However, when the area of actuation and image display becomes small, generally high concentration and long time amount are needed for reading of required actuation and text.
[0010] A series of actuation until it checks reception of an FM multiplex broadcast to the display screen and chooses required information from the received various text is easy, and seldom needs concentration for actuation, but moreover, this invention aims at offering the FM multiplex broadcast receiver which can carry out reading of required actuation and text easily, even if the area of actuation and image display is small.

[Translation done.]

MEANS

[Means for Solving the Problem] Drawing 1 is the explanatory view of the fundamental configuration of invention of claim 1. In drawing 1 the FM multiplex broadcast receiver of claim 1 In the FM multiplex broadcast receiver which has a receiving means 11 to extract the text by the FM multiplex broadcast from FM radio broadcasting channel, and the display means 12 which carries out the image output of the one unit of this text on the display screen A storage means 14 to classify said extracted text for every class of the, and to memorize possible [a call] according to assignment of this class, The selecting switch 17 which was made to correspond to each of the display partition which attached the class name which assigned and corresponds to said display screen for every class of text in the menu display which carried out the image output, and was formed, The text of one unit of the class which corresponds from said storage means 14 according to assignment by said selecting switch 17 is called, and it sends out to said display means 12, and has the control means 15 replaced with the menu display of said display screen.
[0012] Here, when the text of two or more units belongs to the same class, the text of a unit may be around passed on the display screen, and scrolling SUITCHI which specifies the text of one unit before and after carrying out image display on the display screen may be prepared. Moreover, change SUITCHI which returns a display screen to the original menu display compulsorily from the text of one unit may be prepared.
[0013] Moreover, a storage means to memorize the text from which another FM multiplex broadcast receiver of the example of a configuration was extracted with the receiving means, The control means which searches the text accumulated in the storage means, selects the thing of the class corresponding to assignment by selection SUITCHI, sends out to a display means, and the display screen is made to carry out image display, It has a menu display means to carry out image display of the menu display screen which was fitted to the array of two or more selection SUITCHI, and has arranged the display partition with a class name to said display means, and the text of one unit is displayed in the format which replaces a menu display.
[0014] It consists of touch SUITCHI which operates by contact of an operator [on the FM multiplex broadcast receiver of claim 1 and as opposed to / receiver / of claim 2 / FM multiplex broadcast / each of said display partition in said selection SUITCHI].
[0015] In the FM multiplex broadcast receiver of claim 1, said control means identifies the are recording condition of the text for every class in said storage means, and the FM multiplex broadcast receiver of claim 3 has an are recording display means to change the image display condition of said display partition according to the existence of are recording of text.
[0016] The FM multiplex broadcast receiver of claim 4 is set to the FM multiplex broadcast receiver of claim 1. Said control means A reservation means in the text of the class specified with said selecting switch not being accumulated in said storage means to wait for are recording of the text of this class, and to notify an operator of this are recording, In the text of the class specified with said selecting switch not being accumulated in said storage means, it has a period until said selecting switch is operated at least and text is accumulated, and a reservation display means to change the image display condition of the reserved display partition with other parts.
[0017] In the FM multiplex broadcast receiver of claim 1, said display means follows to actuation of said selection SUITCHI, creates the status signal of said class name, and the FM multiplex broadcast receiver of claim 5 has the title display means which carries out an image output on said display screen together with one unit of said text.
[0018] the FM multiplex broadcast receiver of claim 6 comes out of said title display means in the FM multiplex broadcast receiver of claim 5 with the storage element which made a different character−font pattern for a display for every class of said text memorize, and a selection means to call the character−font pattern for a display which follows and corresponds to actuation of said selection SUITCHI, and it is

[0019] In the FM multiplex broadcast receiver of claim 1, said storage means identifies the information number contained in the text of said one unit, and the FM multiplex broadcast receiver of claim 7 has an updating means to eliminate old text, when the text of the already accumulated same information number is inputted.

[0020] While the FM multiplex broadcast receiver of claim 8 carries out the image output of the tuning display which has arranged the display partition of two or more presetting received frequency on said display screen in the FM multiplex broadcast receiver of claim 1 A selected tuning display means to change the display of one display partition with other directions parts, Mode change SUITCHI which makes the image output on said display screen shift to said tuning display from said menu display or presenting of the text of one unit, The presetting station selecting switch which was made to correspond to each of the directions part of two or more of said presetting received frequency, and was formed, The tuning adjustment device which adjusts the received frequency at that time according to the station selection by said presetting station selecting switch, It ****, and it follows to actuation of said mode change SUITCHI, and a SUITCHI mode change means to operate said selection SUITCHI as presetting station selection SUITCHI is established.

[0021] The FM multiplex broadcast receiver of claim 9 establishes a frequency-spectrum-designation means to display the received frequency at that time, an FM multiplex broadcast discernment means to identify the existence of the FM multiplex broadcast in the receiving channel at that time, and an FM multiplex broadcast display means to display the propriety of FM multiplex broadcast reception according to the output of this FM multiplex broadcast discernment means, in the FM multiplex broadcast receiver of claim 8.

[Translation done.]

OPERATION

[Function] With the FM multiplex broadcast receiver of claim 1, the image display of the menu display can be carried out to the display screen of the display means 12, and if selection SUITCHI which was made to correspond to a menu display and was prepared is operated and an operator chooses a desired class, an image output will be carried out in the format that one unit of the text belonging to this class replaces a menu display.

[0023] In drawing 1 , the receiving means 11 extracts the data multiplex band excluding the baseband band of a stereo sound signal from the band of one channel of FM radio broadcasting, restores to the digital data by which FM modulation was carried out, and reproduces the text which performed error detection and agreement correction and consisted of predetermined character codes.

[0024] The text of one unit consists of a header block which distinguishes the class and order of text (time of day, information numerical, etc.), and a data block of the net following this. The storage means 14 reads a header block in the text sent out one after another from the receiving means 11, identifies the class of text, classifies it for every class, and memorizes text. The storage means 14 outputs at a time one unit of text of the class by the control means 15, or the class which corresponds according to one-by-one assignment.

[0025] The display means 12 changes and displays the text of a character code format on the image of the kanji of a multi-line, kana, a figure, and the alphabet, and a television screen, the liquid crystal display component of a multi-DODDO mold, a plasma display device, an LED display device, etc. are adopted as a display screen.

[0026] The internal memory of the display means 12 memorizes beforehand as an image, and the menu display by which image display is carried out to the display screen of the display means 12 is intuitively arranged at an operational condition corresponding to the display partition [in / in selection SUITCHI 17 / a menu display] for every class. Correspondence of a selecting switch 17 and a display partition is (1). The remote control which has arranged the ten key switch which attached the number is fixed to the core of the wheel of an automobile. Give the number of 0-9 corresponding to the display partition which attached the class name in a menu display to ten key SUITCHI, or (2) You may secure in you arranging the display partition in a menu display to a horizontal single tier, making it located under each display partition on the frame of a display screen, and arranging push-button SUITCHI.

[0027] A menu display will be transposed to the text of the class chosen promptly, if assignment actuation of the class of text is made through selection SUITCHI 17. At this time, according to the input from selection SUITCHI 17, a control means 15 calls only one unit and sends out the storage means 14 to one kind of text to the display means 12.

[0028] When it belongs to one kind of traffic information on intersectional and the information on several 10 crossing in Tokyo's 23 Wards is accumulated in the storage means 14 here, it will be necessary to search one unit (1 chome of for example, ****) out of the text of the a large number unit belonging to one class. Then, the skip of the text belonging to the same class can be carried out to information numerical order on a display screen until it prepares scrolling SUITCHI and encounters required text.

[0029] Moreover, image display of one kind of text is carried out, and change SUITCHI may be prepared to come to see the text of another kind so that a display screen can be immediately returned to a menu display compulsorily. However, when image display of the same text continues being carried out to the display screen beyond fixed time amount, the auto return function automatically returned to a menu display may be prepared in the display means 12.

[0030] If a control means calls in order the text accumulated in the storage means, reads a header block and agrees in assignment of the header block by selection SUITCHI, this text will be sent out to a display means and the display screen will be made to carry out image display in another FM multiplex broadcast receiver of the example of a configuration. In a menu display screen, the class (genre) name applicable to

operator looks through a class name on a display screen, operates two or more selection SUITCHI intuitively, and can access the text of a required class.

[0031] In the FM multiplex broadcast receiver of claim 2, selection SUITCHI consists of touch SUITCHI, and an operator touches each display partition on a display screen directly, and can choose the class of text. The transparent electrode mold stuck on the display screen, the infrared mold which detects protection from light, the ultrasonic mold which detects attenuation of vibration can be used for touch SUITCHI.

[0032] In the FM multiplex broadcast receiver of claim 3, uniformly, the image condition of each display partition in a menu display is not eternal, and changes it into the image conditions (deletion of change of color or brightness, lighting flashing, and a display partition, character representation which is not accumulated [are recording /]) which reflected the are recording condition of the text for every class in a storage means with the are recording display means to regulate automatically. At this time, the display partition of the accumulated class (genre) is made into a selectable condition, and the display partition of a non-accumulated class (genre) is good also as selection disapproval. Therefore, an operator only looks at a menu display and can identify the are recording condition of the text received by that time.

[0033] In the FM multiplex broadcast receiver of claim 4, when an operator wishes to receive and the text of a required class is not accumulated in a storage means, a reservation display means is used and reception can be reserved. A reservation display means supervises the are recording condition of the text in a storage means instead of an operator, and shortly after the text of the reserved class is accumulated, it notifies the completion of are recording to an operator. At this time, the text of the reserved class may be immediately displayed on the display screen of a display means.

[0034] And a reservation display means changes the image conditions (deletion of change of color or brightness, lighting flashing, and a display partition, character representation which is not accumulated [are recording /]) of the display partition concerning reservation in parts for other display about a period until the text of the class reserved at least is accumulated, and expresses the fact that reservation was performed, to the display screen.

[0035] With the FM multiplex broadcast receiver of claim 5, the data of a header block are read in the text of one unit called from the storage means for image display, and the image output of the parts (class etc.) which carry out character representation from a header block at least is carried out in the format which it tends to read except being specified as the header block.

[0036] The image output form specified as the header block serves as a katakana cable address display (for example, JUUTAI) for number-of-bits saving, and is changed into the kanji Cana mixture word (delay information) which is easy to read this. For example, a required number of kanji Cana mixture words are beforehand accumulated in the internal memory of a display means, the command signal according to the contents of reading of the data of a header block is sent out from a control means, and image display of the corresponding kanji Cana mixture word is carried out to the upper part of the display screen.

[0037] In the FM multiplex broadcast receiver of claim 6, a character-font pattern for a display which is different for every class of text in a storage element is made to memorize, and the character-font pattern for a display with which a selection means follows and corresponds to actuation of selection SUITCHI is called.

[0038] In the FM multiplex broadcast receiver of claim 7, when the hour entry and information number of a header block which are contained in the text of one unit are identified and the text of the same information number is already accumulated, the older one is eliminated and the newer one is memorized. The information which became unnecessary by this is arranged and an operator can carry out required retrieval only in the range of always new information. Moreover, when the corresponding text is already then displayed on the display screen, a display may be immediately replaced by new text. Moreover, the updated text is memorized all together and you may indicate by automatic for every fixed time amount in the display screen. The newest text can thereby always be displayed automatically.

[0039] For example, the delay information on the 1 chome crossing of **** at 3:00 p.m. is automatically transposed to the delay information on the 1 chome crossing of **** at 4:00 p.m. However, text with the same old information number can also be utilized, when investigating the die length of delay serially and expecting a future delay situation (an improvement, aggravation). Therefore, old text may not be eliminated immediately but another storage means memorized in the condition that it can call within the limit of fixed time amount if needed may be established. Moreover, in case it accumulates in another storage means, the text which saves and has utility value may be identified and an unnecessary thing may be removed.

[0040] In the FM multiplex broadcast receiver of claim 8, the configuration of the operating part in the FM multiplex broadcast receiver which has the function of the receiver of the usual FM commercial broadcasting (stereo voice) is simplified. That is, the condition in which reception adjustment of FM commercial broadcasting is possible is converted into the condition that required information can be

retrieved by actuation of mode change SUITCHI, through an FM multiplex broadcast, and it is (1) to coincidence. Image display changes from a tuning display to a menu display, and it is (2). SUITCHI which perform reception adjustment of FM commercial broadcasting is diverted as they are to SUITCHI which retrieve required information through an FM multiplex broadcast.

[0041] In the FM multiplex broadcast receiver of claim 9, even when one of the presetting stations is chosen, and even when changing received frequency continuously manually, an operator can check the received frequency at that time by looking through a frequency-spectrum-designation means. And an operator can check by looking that an FM multiplex broadcast can receive from the received channel through an FM multiplex broadcast display means.

[0042] There are few channels which an FM multiplex broadcast can receive among the channels of FM radio broadcasting, and the FM multiplex broadcast may not be sent out only by commercial broadcasting by the channel which an FM multiplex broadcast can receive depending on the time zone. Therefore, looking for the channel which an FM multiplex broadcast can actually receive also has many difficulties. Moreover, in a remote place, since the quota channel of a broadcasting station is not the same as that of the thing of the suburbs ground, preset frequency stops being helpful, received frequency will be adjusted one by one by manual actuation, and presetting will newly be done again. In such a case, it sets, and a frequency-spectrum-designation means and an FM multiplex broadcast display means discover the channel which contains an FM multiplex broadcast in whether you are Sumiya, and save time amount until it receives text data.

[Translation done.]

EXAMPLE

[Example] Drawing 2 is the explanatory view of the circuitry of the FM multiplex broadcast receiver of the 1st example, and drawing 3 is the external view of the FM multiplex broadcast receiver of drawing 2 . Here, although the FM multiplex broadcast receiver is built into the car stereo equipped with the receiver of FM commercial broadcasting, it has the receive section of an FM multiplex broadcast which became independent of the receive section of FM commercial broadcasting, and FM commercial broadcasting of another channel can be enjoyed, performing reception of an FM multiplex broadcast, and are recording of text.
[0044] It consists of the interface sections 23 which an operator searches the text stored in the FM multiplex broadcast receive section 22 which an FM multiplex broadcast receiver chooses FM radio broadcasting receive section 21 which chooses the channel of arbitration and does voice playback of the usual stereophonic broadcasting, and the specific channel which is carrying out the FM multiplex broadcast, accumulates text, and outputs the text of one specific unit according to retrieval by the operator, and the FM multiplex broadcast receive section 22 in drawing 2 , and carry out image display. The electric wave received with the antenna 25 is distributed to FM radio broadcasting receive section 21 and the FM multiplex broadcast receive section 22 through branching 24.
[0045] The FM multiplex broadcast receive section 22 has two memory, one memory accumulates and updates the received text for every class, and the memory of another side chooses received frequency according to the classification of required information, when received frequency of the FM-broadcasting channel which an FM multiplex broadcast can receive is memorized (presetting is possible) and there are more than one.
[0046] After the FM multiplex broadcast receive section 22 extracts the 60-92kHz part centering on 76kHz of carrier frequencies among the 100kHz one-channel quota bands of FM broadcasting, does FM detection, restores to the digital data by which the L-MSK (Minimumm Shift Keying) modulation was carried out and performs predetermined error detection and agreement correction, it does a class division for every text of one unit which creates the 1 display screen, and stores in memory in the state of judgment.
[0047] The microcomputer for data processing of the FM multiplex broadcast receive section 22 follows the carried program, and is various functions.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the explanatory view of the fundamental configuration of this invention.
[Drawing 2] It is the explanatory view of the configuration of the FM multiplex broadcast receiver of the 1st example.
[Drawing 3] It is the explanatory view of the appearance of the FM multiplex broadcast receiver of drawing 2 .
[Drawing 4] It is the explanatory view of the control panel of the FM multiplex broadcast receiver of drawing 2 .
[Drawing 5] It is the explanatory view of the are recording condition of the text in the FM multiplex broadcast receiver of drawing 2 .
[Drawing 6] It is the explanatory view of the control panel of the FM multiplex broadcast receiver of the 2nd example.
[Description of Notations]
11 Receiving Means
12 Display Means
14 Storage Means
15 Control Means
17 Selection SUITCHI

[Translation done.]
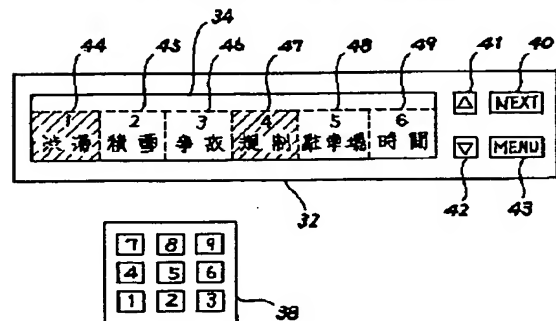

DRAWINGS

[Drawing 3]
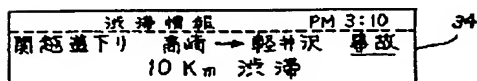
第1実施例のFM多重放送受信機の外観
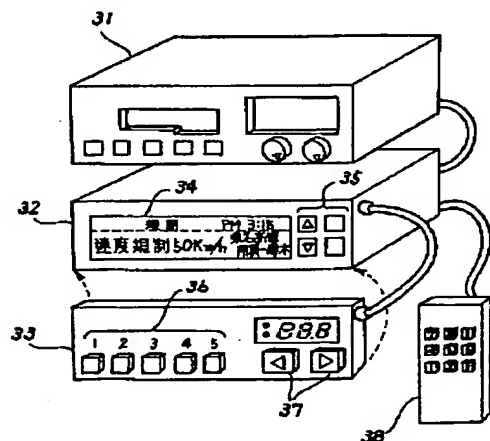
[Drawing 4]

FM多重放送受信機の操作パネル

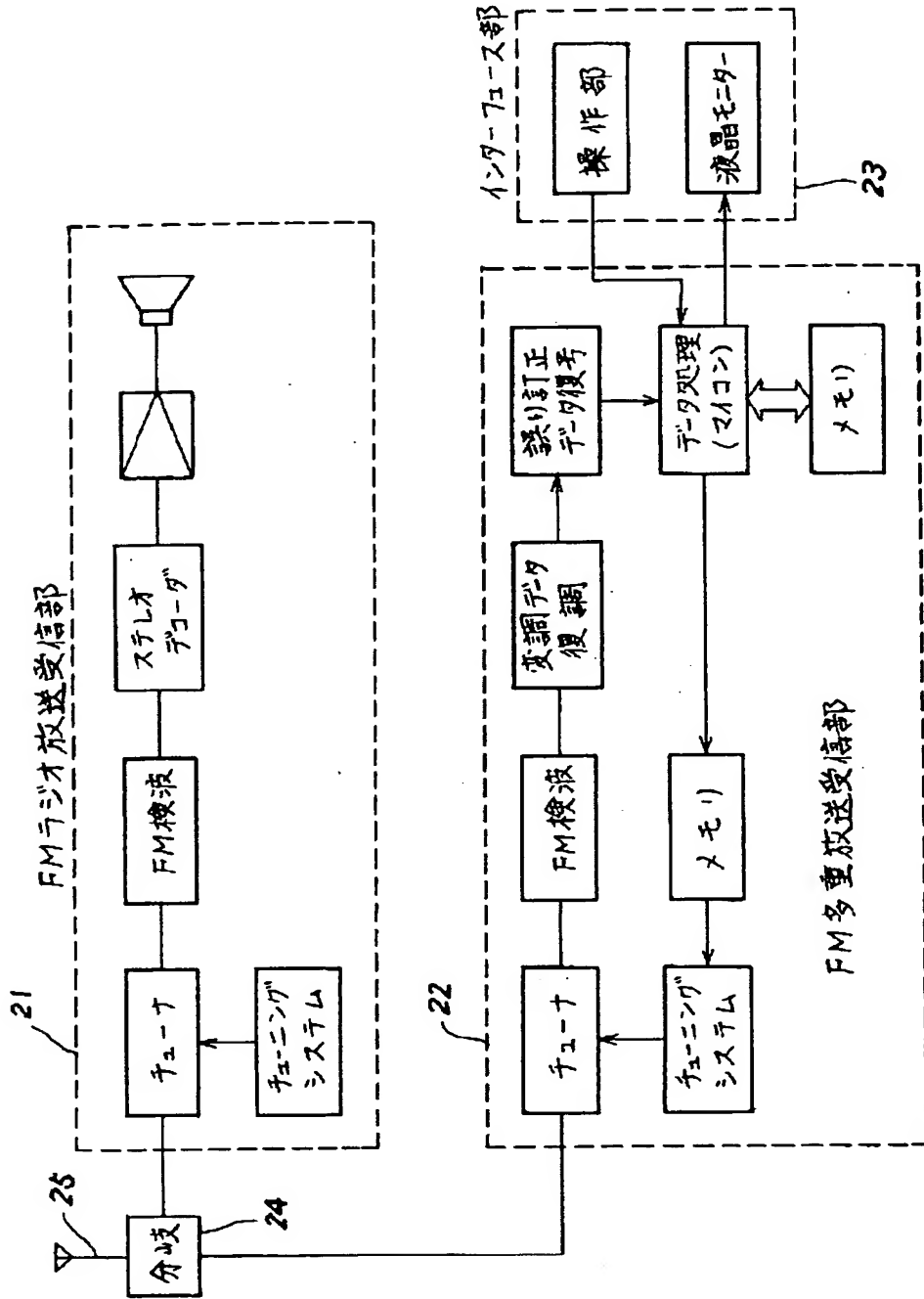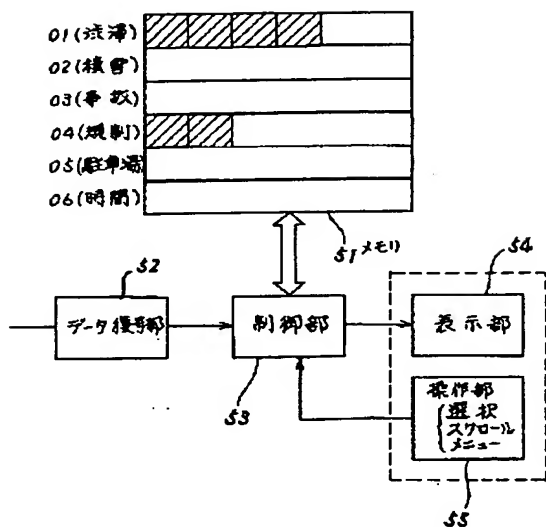(a) メニュー表示状態のFM多重放送受信機

(b) 渋滞情報の表示状態

[Drawing 1]
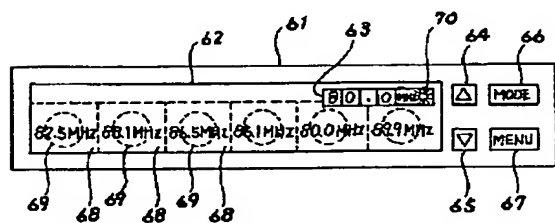
本発明の基本的な構成
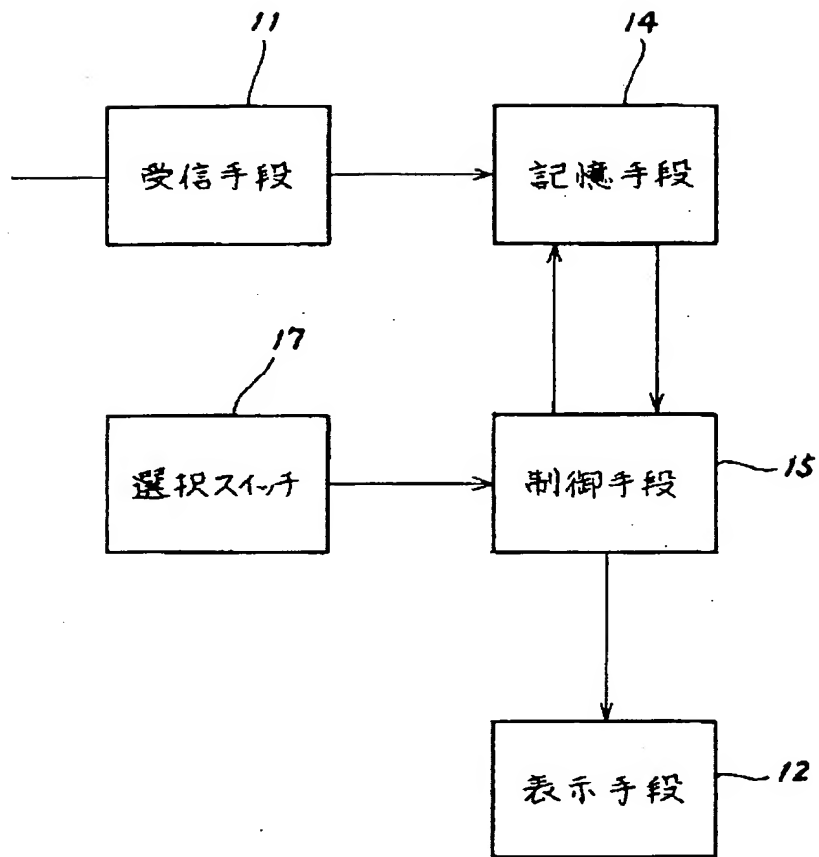
[Drawing 2]

第1実施例のFM多重放送受信機の構成

インターフェース部

操作部

液晶モニター

23

FMラジオ放送受信部

21

スピーカー

ステレオ
デコーダ

FM検波

チューナ

チューニング
システム

誤り訂正
データ復号

変調データ
復調

FM検波

データ処理
(マイコン)

メモリ

メモリ

チューナ

チューニング
システム

FM多重放送受信部

22

25

分岐

24

[Drawing 5]

文字情報の蓄積状態

01(渋滞)				
02(積雪)				
03(事故)				
04(規制)				
05(駐車場)				
06(時間)				

51 メモリ

52 データ復号部 → 53 制御部 → 54 表示部

55 操作部
選択
スクロール
メニュー

[Drawing 6]

FM多重放送受信機の操作パネル

(a) FM放送チャンネルをチューニングするモード

62 61 63 70 64 66

62.5MHz 66.1MHz 66.5MHz 66.1MHz 80.0MHz 62.9MHz   △ MODE   ▽ MENU

69 68 69 68 69 68   65 67

(b) FM多重放送を受信中のモード

68 69

渋滞 | 積雪 | 事故 | 規制 | 駐車場 | 時間

[Translation done.]